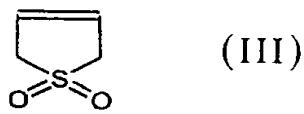
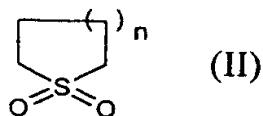
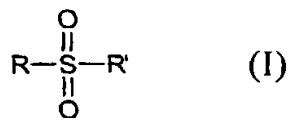


**WHAT IS CLAIMED IS:**

1. An electrolyte for a lithium secondary battery comprising:  
a non-aqueous organic solvent; and  
a sulfone based organic compound selected from the group consisting  
5 of a compound represented as in the following Formulae (I), (II), or (III), and  
a mixture thereof:



10 where R and R' are independently selected from the group consisting  
of a primary, secondary, or tertiary alkyl group, alkenyl group, and aryl group;  
and a substituted primary, secondary, or tertiary alkyl group, alkenyl group, and  
aryl group, and n is from 0 to 3.

15 2. The electrolyte for a lithium secondary battery according to  
claim 1, wherein the substituent is halogen selected from the group consisting  
of fluoro, chloro, bromo, and iodo.

3. The electrolyte for a lithium secondary battery according to  
claim 1, wherein the sulfone based organic compound is selected from the

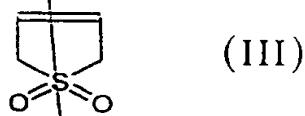
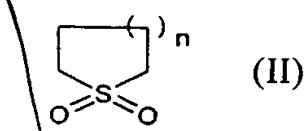
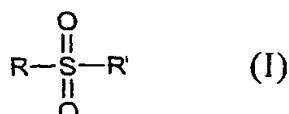
group consisting of methyl sulfone, vinyl sulfone, phenyl sulfone, 4-fluorophenyl sulfone, benzyl sulfone, tetramethylene sulfone, and butadiene sulfone.

4. The electrolyte for a lithium secondary battery according to claim 1, wherein the amount of the sulfone based organic compound is 0.1 to 10 weight%.

5. A lithium secondary battery comprising:  
an electrolyte comprising a non-aqueous organic solvent and a sulfone  
based organic compound selected from the group consisting of a compound  
represented as in the following Formulae (I), (II), or (III), and a mixture  
thereof;

a positive electrode including lithium-transition metal oxides as a positive active material; and

a negative electrode including carbon, carbon composite, lithium metal, or lithium alloy as a negative active material:



where R and R' are independently selected from the group consisting

of a primary, secondary, or tertiary alkyl group, alkenyl group, and aryl group; and a substituted primary, secondary, or tertiary alkyl group, alkenyl group, and aryl group, and  $n$  is from 0 to 3.

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